

Table of Contents

Summary.....	ii
Changes from Draft to Final EIS.....	v
Document Structure	v
Chapter 1 - PURPOSE AND NEED	1-1
I. INTRODUCTION.....	1-1
II. PURPOSE AND NEED FOR ACTION	1-4
III. PROPOSED ACTION	1-6
IV. PUBLIC INVOLVEMENT	1-7
A. Previous Proposals.....	1-7
B. Beaver Creek Scoping.....	1-8
C. Beaver Creek DEIS	1-8
V. ALTERNATIVE DEVELOPMENT PROCESS.....	1-9
A. Issues Used for Alternative Development	1-9
B. Analysis Issues	1-11
VI. DECISION FRAMEWORK.....	1-11
A. Scope of Analysis and Decision	1-11
B. Other Related Efforts.....	1-12
Chapter 2 - ALTERNATIVES	2-1
I. INTRODUCTION.....	2-1
II. ALTERNATIVES CONSIDERED IN DETAIL	2-1
A. Action Alternatives.....	2-1
B. Road Management Activities.....	2-13
C. Features Common to All Action Alternatives	2-20
D. Alternative D – No Action	2-26
III. CONSISTENCY WITH THE CUSTER FOREST PLAN	2-26
A. Forest Plan Consistency - Action Alternatives.....	2-26
B. Forest Plan Consistency - No Action Alternative	2-38
IV. CUMULATIVE EFFECTS.....	2-38
V. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY ...	2-42
A. East Otter Hazardous Fuel Project Proposal	2-42
B. Whitetail Hazardous Fuel Project Proposal.....	2-42
C. January 2010 Proposed Action Alternative.....	2-42
D. No Treatment in Noxious Weed Areas Alternative	2-43
E. Maintain All Roads Alternative.....	2-44
F. Structure Ignitability Alternative	2-44
G. No Commercial Timber Sale Alternative.....	2-45
H. Prescribed Burning Only Alternative	2-45
I. No Temporary Roads Alternative.....	2-45
J. Max Fuels Treatment Alternative.....	2-46
VI. SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE.....	2-46

Chapter 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	3-1
SECTION 3 .1	3-2
FOREST VEGETATION	3-2
I. Introduction	3-2
A. Forest Vegetation Regulatory Framework.....	3-2
B. Forest Vegetation Effects Analysis Methodology	3-6
C. Canopy Layers and Canopy Cover Effects Analysis Methodology	3-8
D. Understory Production Effects Analysis Methodology	3-12
E. Large Woody Debris Effects Analysis Methodology	3-12
F. Forest Insect and Disease Susceptibility Effects Analysis Methodology	3-13
II. Affected Environment for Forest Vegetation	3-16
III. Effects of Alternative A on Forest Vegetation – Proposed Action	3-18
A. Effects of Alternative A on Canopy Layers and Canopy Cover	3-18
B. Effects of Alternative A on Understory (Non Tree) Productivity.....	3-24
C. Effects of Alternative A on Large Woody Debris.....	3-25
D. Effects of Alternative A on Forest Insect and Disease Susceptibility	3-27
IV. Effects of Alternative B on Forest Vegetation – Preferred Alternative	3-30
A. Effects of Alternative B on Canopy Layers and Canopy Cover	3-30
B. Effects of Alternative B on Understory (Non Tree) Productivity.....	3-31
C. Effects of Alternative B on Large Woody Debris	3-31
D. Effects of Alternative B on Forest Insect and Disease Susceptibility	3-31
V. Effects of Alternative C on Forest Vegetation - No Treatment in Goshawk PFA's.	3-32
A. Effects of Alternative C on Canopy Layers and Canopy Cover	3-32
B. Effects of Alternative C on Understory (Non Tree) Productivity	3-34
C. Effects of Alternative C on Large Woody Debris	3-35
D. Effects of Alternative C on Forest Insect and Disease Susceptibility	3-35
E. Other Required Disclosures Under All Action Alternatives for Effects to Forest Vegetation	3-36
F. Conclusions for Environmental Consequences of Proposed Action Alternatives on Effects to Forest Vegetation	3-39
VI. Effects of Alternative D on Forest Vegetation – No Action	3-41
A. Effects of Alternative D on Canopy Layers and Canopy Cover.....	3-41
B. Effects from Alternative D on Understory (Non Tree) Production	3-43
C. Effects of Alternative D on Large Woody Debris.....	3-44
D. Effects from Alternative D on Forest Insect and Disease Susceptibility	3-47
E. Other Required Disclosures Under Alternative D for Forest Vegetation.....	3-49
F. Conclusions for Environmental Consequences of Alternative D on Effects to Forest Vegetation.....	3-51
SECTION 3 .2	3-53
FUELS	3-53
I. Introduction	3-53
A. Fuels Regulatory Framework	3-54
B. Fuels Effects Analysis Methodology	3-59
C. Spatial & Temporal Bounds Used for Fuels Effects Analysis.....	3-63

II. Affected Environment For Fuels.....	3-63
A. Wind.....	3-63
B. Species Composition.....	3-63
C. Stand Structure and FRCC	3-64
D. Surface Fuel Loading.....	3-65
E. Canopy Characteristics	3-66
F. Fire Behavior.....	3-67
III. Effects Common To All Action Alternatives For Fire/Fuels	3-69
A. Fuel Accumulation.....	3-69
B. Unplanned Ignition	3-69
C. Greater than 40 Acre Openings	3-69
D. Prescribed Fire Maintenance.....	3-71
IV. Effects of Alternative A on Fuels - Proposed Action.....	3-71
A. Direct & Indirect Effects of Proposed Action Alternative on Fuels	3-71
B. Cumulative Effects of Proposed Action on Fuels	3-78
C. Other Required Disclosures with Proposed Action	3-81
D. Conclusions of Effects for Alternative A.....	3-81
V. Effects of Alternative B on Fuels - Preferred Alternative	3-83
A. Direct and Indirect Effects of Alternative B on Fuels.....	3-83
B. Cumulative Effects.....	3-86
C. Other Required Disclosures for Alternative B.....	3-87
D. Conclusions of Effects for Alternative B.....	3-87
VI. Effects of Alternative C on Fuels.....	3-88
A. Direct and Indirect Effects of Alternative C on Fuels.....	3-88
B. Cumulative Effects.....	3-91
C. Other Required Disclosures for Alternative C.....	3-92
D. Conclusions of Effects for Alternative C	3-92
VII. Effects of Alternative D on Fuels - No Action	3-93
A. Direct & Indirect Effects of No Action Alternative on Fuels	3-93
B. Cumulative Effects of No Action Alternative	3-95
C. Other Required Disclosures with No Action Alternative.....	3-96
D. Conclusions for Effect of No Action Alternative on Fuels	3-96
SECTION 3 .3	3-98
SOILS	3-98
I. Introduction	3-98
A. Overview	3-98
B. Regulatory Framework	3-100
II. Affected Environment for Soil Quality	3-101
A. Introduction	3-101
B. Soil Types	3-101
C. Field Surveys.....	3-104
III. Effects Of Action Alternatives (A, B, &C)	3-108
A. Assumptions, Methodology & Scientific Accuracy, and Information Used for Soils Analysis	3-108
B. Description of Spatial and Temporal Bounds Used for Effects Analysis.....	3-109
C. Direct and Indirect Effects to Soil Quality from Action Alternatives	3-110
D. Cumulative Effects of Action Alternatives	3-121
E. Required Disclosures for Action Alternatives	3-123
F. Conclusions for Environmental Consequences of Action Alternatives.....	3-123

IV. Effects of Alternative D on Soil Quality – No Action.....	3-124
A. Direct and Indirect Effects of Alternative D – No Action on Soil Quality	3-124
B. Cumulative Effects to Soil Quality from Alternative D No Action	3-125
C. Required Disclosures for Alternative D No Action.....	3-125
D. Conclusions for Environmental Consequences of No Action Alternative	3-126
SECTION 3 .4	3-127
WATER RESOURCES.....	3-127
I. Introduction	3-127
A. Regulatory Framework	3-127
B. Assumptions, Methodology, and Scientific Accuracy of Information Used	3-132
II. Affected Environment	3-134
A. Introduction	3-134
B. Natural Characteristics and Processes.....	3-134
C. Geology, Landform, Erosion and Sediment	3-134
D. Precipitation and Flow Regimes.....	3-135
E. Human Influences	3-136
III. Effects of Alternative A on Water Resources – Proposed Action.....	3-139
A. Direct Effects.....	3-139
B. Indirect Effects	3-140
C. Cumulative Effects	3-143
IV. Effects of Alternative B on Water Resources – Preferred Alternative.....	3-147
A. Direct Effects.....	3-147
B. Indirect Effects	3-147
C. Cumulative Effects	3-149
V. Effects of Alternative C on Water Resources	3-151
A. Direct Effects.....	3-151
B. Indirect Effects	3-151
C. Cumulative Effects	3-154
VI. Effects of Alternative D on Water Resources - No Action Alternative.....	3-156
A. Direct Effects.....	3-156
B. Indirect Effects	3-156
C. Cumulative Effects	3-156
VII. Comparison of Alternatives.....	3-158
VIII. REQUIRED DISCLOSURES FOR ALTERNATIVES.....	3-158
SECTION 3 .5	3-160
Economics.....	3-160
I. Introduction	3-160
A. Regulatory Framework	3-160
B. Methods	3-161
C. Project Feasibility	3-162
D. Financial Efficiency	3-162
E. Economic Impacts (Jobs and Labor Income).....	3-163
F. Environmental Justice	3-163
II. Affected Environment for Economics	3-164
A. Community Demographics	3-164
B. Employment.....	3-164
C. Income	3-164
D. Specialization	3-164

E. Custer National Forest Timber Program.....	3-165
III. Effects of Alternatives A, B and C on Economics - Action Alternatives.....	3-167
A. Direct and Indirect Effects of Action Alternatives on Economics	3-167
B. Cumulative Effects.....	3-176
C. Other Required Disclosures Under Action Alternatives to Economics.....	3-176
D. Conclusions for Environmental Consequences of Action Alternatives on Economics.....	3-177
SECTION 3 .6	3-178
Sensitive Plants	3-178
I. Introduction	3-178
A. Key Issues.....	3-178
B. Sensitive Plants Regulatory Framework.....	3-178
C. Assumptions, Methodology & Scientific Accuracy, and Information Used	3-178
II. Heavy sedge	3-181
A. Affected Environment.....	3-181
B. Effects of Action Alternatives (A, B, and C) on Heavy Sedge.....	3-182
C. Effects of Alternative D (No Action) on Heavy Sedge.....	3-187
D. Conclusions for Heavy Sedge	3-188
III. Barr's milkvetch and Nuttall Desert-Parsley	3-189
A. Affected Environment for Barr's Milkvetch and Nuttall desert-Parsley	3-189
B. Effects of Action Alternatives (A, B, and C) on Barr's milkvetch and Nuttall Desert- Parsley	3-190
C. Effects of Alternative D (No Action) on Barr's milkvetch and Nuttall Desert-Parsley	3-191
D. Conclusions for Barr's milkvetch and Nuttall desert-parsley	3-192
IV. Effects Determination Summary.....	3-193
SECTION 3 .7	3-194
RANGE	3-194
I. Introduction for Rangeland Resources	3-194
A. Rangeland Resources Regulatory Framework	3-196
B. Assumptions, Methodology And Scientific Accuracy, and Information Used for Effects to Rangeland Resources	3-196
C. Description of Spatial Bounds Used For The Effects Analysis	3-197
D. Description of Temporal Bounds Used for Effects Analysis	3-197
E. Past, Present, & Reasonably Foreseeable Future Actions Considered for Cumulative Effects Analysis.....	3-197
II. Affected Environment of Rangeland Resources	3-197
A. Non-forest Vegetation.....	3-197
B. Livestock Grazing.....	3-199
C. Mitigation	3-202
III. Effects of Alternatives A, B and C on Rangeland Resources	3-203
A. Direct and Indirect Effects of Action Alternatives to Rangeland Resources	3-203
B. Cumulative Effects of Action Alternatives to Rangeland Resources.....	3-205
C. Other Required Disclosures Under Action Alternatives to Rangeland Resources.....	3-205
D. Conclusions for Environmental Consequences of the Action Alternatives on Rangeland Resources	3-206

IV. Effects of Alternative D on Rangeland Resources – No Action.....	3-206
A. Direct and Indirect Effects of No Action Alternative to Rangeland Resources	3-206
B. Cumulative Effects of No Action Alternative to Rangeland Resources.....	3-208
C. Other Required Disclosures Under No Action Alternative for Rangeland Resources	3-209
D. Conclusions for Environmental Consequences of No Action Alternative on Rangeland Resources.....	3-209
SECTION 3 .8	3-210
NOXIOUS WEEDS	3-210
I. Introduction	3-210
A. Regulatory Framework for Noxious Weeds	3-210
B. Assumptions, Methodology and Scientific Accuracy, and Information Used for Noxious Weeds.....	3-211
C. Description of Spatial and Temporal Bounds Used for Noxious Weeds Effects Analysis	3-212
D. Past, Present, & Reasonably Foreseeable Future Actions Considered for Noxious Weeds Cumulative Effects Analysis.....	3-212
II. Affected Environment for Noxious Weeds.....	3-213
A. Mitigations	3-215
III. Effects of Alternatives A, B and C on Noxious Weeds – Action Alternatives.....	3-216
A. Direct and Indirect Effects of Action Alternatives for Noxious Weeds.....	3-216
B. Cumulative Effects of Action Alternatives to Noxious Weeds	3-217
C. Other Required Disclosures Under Action Alternatives to Noxious Weeds	3-217
D. Conclusions for Environmental Consequences of Action Alternatives on Noxious Weeds	3-218
IV. Effects of Alternative D on Noxious Weeds - No Action.....	3-218
A. Direct and Indirect Effects of No Action Alternative for Noxious Weeds.....	3-218
B. Cumulative Effects of No Action Alternative for Noxious Weeds	3-218
C. Other Required Disclosures Under No Action to Noxious Weeds.....	3-218
D. Conclusions for Environmental Consequences of No Action Alternative on Noxious Weeds	3-219
SECTION 3 .9	3-220
SCENERY RESOURCES	3-220
I. Introduction	3-220
A. Scenery Resources Regulatory Framework.....	3-220
B. Scenery Resources Effects Analysis Methodology	3-222
C. Description of Spatial and Temporal Bounds Used for Effects Analysis	3-223
D. Past, Present, & Reasonably Foreseeable Future Actions Considered for Cumulative Effects Analysis	3-223
II. Affected Environment for Scenery Resources.....	3-224
A. Landscape Character	3-224
B. Existing Visual Condition	3-224
C. Critical View Points	3-224
III. Effects Of Alternatives A, B and C on Scenery Resources - Action Alternatives ...	3-225
A. Direct and Indirect Effects of Action Alternatives on Scenery Resources.....	3-225
B. Cumulative Effects of Action Alternatives on Scenery Resources	3-228

C.	Other Required Disclosures Under Action Alternatives to Scenery Resources	3-229
D.	Conclusions for Environmental Consequences of Action Alternatives on Scenery Resources.....	3-230
IV.	Effects Of Alternative D on Scenery Resources – No Action.....	3-230
A.	Direct and Indirect Effects of No Action Alternative on Scenery Resources.....	3-230
B.	Cumulative Effects of No Action Alternative on Scenery Resources	3-231
C.	Other Required Disclosures Under No Action Alternative on Scenery Resources	3-231
D.	Conclusions for Environmental Consequences of No Action Alternative on Scenery Resources.....	3-232
SECTION 3 .10.....		3-233
RECREATION _____		3-233
I.	Introduction	3-233
A.	Regulatory Framework.....	3-233
B.	Effects Analysis Methodology	3-235
C.	Spatial and Temporal Bounds.....	3-236
D.	Past, Present, & Reasonably Foreseeable Future Actions Considered for Cumulative Effects Analysis	3-236
II.	Affected Environment	3-236
A.	Recreation Opportunity Spectrum (ROS) Settings.....	3-236
B.	Hunting.....	3-237
III.	Effects of Action Alternatives.....	3-238
A.	Recreation Opportunity Spectrum (ROS) Settings.....	3-238
B.	Hunting.....	3-239
C.	Cumulative Effects of Action Alternatives	3-240
D.	Other Required Disclosures For Action Alternatives	3-241
E.	Conclusions for Environmental Consequences of Action Alternatives on Recreation Resources	3-242
F.	Other Required Disclosures for Action Alternatives	3-242
G.	Conclusions for Environmental Consequences of Action Alternatives	3-243
IV.	Effects Of Alternative D - No Action	3-243
A.	Recreation Opportunity Spectrum (ROS)	3-243
B.	Other Required Disclosures - No Action Alternative	3-244
C.	Conclusions for No Action Alternative	3-244
SECTION 3 .11.....		3-245
CULTURAL RESOURCES_____		3-245
I.	Introduction	3-245
A.	Affected Environment.....	3-245
II.	Effects of Alternative A on Cultural Resources - Proposed Action Alternative	3-246
A.	Direct and Indirect Effects	3-246
B.	Cumulative Effects.....	3-248
III.	Effects of Alternative B on Cultural Resources- Preferred Alternative	3-248
A.	Direct and Indirect Effects	3-248
B.	Cumulative Effects.....	3-250
IV.	Effects of Alternative C on Cultural REsources - No Treatment in Goshawk PFAs	3-250
A.	Direct and Indirect Effects	3-250

B. Cumulative Effects.....	3-251
V. Effects of Alternative D on Cultural Resources - No Action Alternative	3-252
A. Direct and Indirect Effects	3-252
B. Cumulative Effects.....	3-253
SECTION 3 .12.....	3-255
CARBON FLUX.....	3-255
I. Introduction	3-255
A. Carbon Flux Regulatory Framework	3-255
B. Assumptions, Methodology, Scientific Accuracy, And Information Used For Carbon Flux Analysis:.....	3-256
C. Description of Spatial and Temporal Bounds Used for Carbon Flux Effects Analysis	3-258
D. Past, Present, & Reasonably Foreseeable Future Actions Considered For Carbon Flux Cumulative Effects Analysis	3-258
II. Affected Environment for Carbon Flux	3-258
A. Effects of Alternatives A, B and C on Carbon Flux – Action Alternatives.....	3-263
A. Cumulative Effects of Action Alternatives on Carbon Flux.....	3-265
B. Other Required Disclosures Under Action Alternatives for Carbon Flux.....	3-266
C. Conclusions for Environmental Consequences of Action Alternatives on Carbon Flux.....	3-266
III. Effects of Alternative D on Carbon Flux – No Action Alternative	3-267
A. Direct and Indirect Effects of No Action Alternative on Carbon Flux.....	3-267
B. Cumulative Effects of No Action Alternative on Carbon Flux	3-268
C. Other Required Disclosures Under No Action Alternative – Carbon Flux	3-269
D. Conclusions for Environmental Consequences of No Action Alternative on Carbon Flux	3-270
Section 3 .13.....	3-271
AIR QUALITY.....	3-271
I. Introduction	3-271
A. Spatial and Temporal Bounds.....	3-271
B. Regulatory Framework	3-272
II. Affected Environment – Air Quality	3-275
A. Climate and Wind Direction	3-275
B. Air Quality/Pollution	3-276
III. Effects Common to All Action Alternatives	3-277
A. Direct & Indirect Effects on Air Quality	3-277
B. Cumulative Effects on Air Quality	3-280
C. Forest Plan Consistency of Proposed Action Alternative	3-280
IV. Effects of No Action Alternative on Air Quality	3-280
A. Direct & Indirect Effects on Air Quality	3-280
B. Cumulative Effects on Air Quality	3-281
C. Forest Plan Consistency of No Action Alternative	3-281
SECTION 3 .14.....	3-282
WILDLIFE.....	3-282
I. Introduction	3-282
A. Key Issues.....	3-282

B.	Affected Environment.....	3-282
C.	Species Analyzed	3-283
D.	Effects Analysis.....	3-294
E.	Spatial and Temporal Bounds.....	3-294
II.	Black-footed Ferret.....	3-295
A.	Regulatory Framework for Black-footed ferret	3-295
B.	Effects Analysis Methodology for Black-footed ferret.....	3-296
C.	Affected Environment for Black-footed ferret.....	3-296
D.	Environmental Consequences for Black-footed Ferret.....	3-297
III.	Northern Goshawk.....	3-300
A.	Introduction	3-300
B.	Regulatory Framework	3-301
C.	Effects Analysis Methodology for Northern Goshawk.....	3-301
D.	Affected Environment for Northern Goshawk	3-304
E.	Environmental Consequences for Northern Goshawk (Step Four – Treatment Context).....	3-319
IV.	Big Game (Elk, Mule Deer and White-tailed Deer)	3-322
A.	Regulatory Framework for Big Game.....	3-322
B.	Effects Analysis Methodology for Big Game	3-323
C.	Affected Environment for Big Game.....	3-325
D.	Environmental Consequences for Big Game	3-333
V.	Black-backed Woodpecker and Snag Habitat.....	3-338
A.	Regulatory Framework For Black-Backed Woodpecker & Snag Habitat	3-338
B.	Effects Analysis Methodology For Black-Backed Woodpecker & Snag Habitat	3-339
C.	Affected Environment For Black-Backed Woodpecker & Snag Habitat	3-339
D.	Environmental Consequences for Black-backed Woodpecker & Snag Habitat	3-341
VI.	Bats	3-345
A.	Regulatory Framework for Bats	3-345
B.	Effects Analysis Methodology for Bats.....	3-345
C.	Affected Environment for Bats	3-345
D.	Environmental Consequences for Bats.....	3-346
VII.	Migratory Birds.....	3-349
A.	Regulatory Framework for Migratory birds	3-349
B.	Effects Analysis Methodology for Migratory birds	3-351
C.	Affected Environment for Migratory birds.....	3-351
D.	Environmental Consequences for Migratory Birds	3-352
VIII.	Amphibians and Reptiles.....	3-354
A.	Regulatory Framework for Amphibians and Reptiles.....	3-354
B.	Effects Analysis Methodology for Amphibians and Reptiles	3-355
C.	Affected Environment for Amphibians and Reptiles.....	3-355
D.	Environmental Consequences for Amphibians and Reptiles	3-355
IX.	Other Required Disclosures.....	3-367
CHAPTER 4 – RESPONSE TO COMMENTS.....		4-1
I.	Public Comment Analysis Process.....	4-1
II.	Chapter 1 and Chapter 2.....	4-2
	Proposed Action and Alternatives	4-2
	Forest Plan	4-10
III.	Section 3.1 – Forest Vegetation	4-13
	Existing / Desired Condition	4-13

IV. Section 3.2 - Fuels	4-18
Fire & Fuels / Vegetation	4-18
V. Section 3.3 - Soils.....	4-25
VI. Section 3.4 – Water Resources.....	4-28
VII. Section 3.5 - Economics.....	4-29
VIII. Sections 3.6, 3.7 & 3.8 – Sensitive Plants, Range & Noxious Weeds.....	4-31
IX. Section 3.9 – Scenery Resources.....	4-39
X. Section 3.12 - Carbon	4-40
XI. Section 3.13 – Air Quality.....	4-41
XII. Section 3.14 - Wildlife.....	4-41
General.....	4-41
Black-footed ferret.....	4-49
Goshawk / Old Growth	4-51
Big Game	4-60
Migratory Birds, Cavity Nesters, Black-backed woodpecker & Bats	4-65
Snags.....	4-67
Chapter 5 - Consultation and Coordination.....	5-1
I. Preparers and Contributors	5-1
A. ID Team Members:	5-1
B. Federal, State, and Local Agencies:.....	5-3
II. Distribution of the Environmental Impact Statement.....	5-3
A. U.S. Federal Officials	5-3
B. U.S. Federal Agencies.....	5-4
C. Native American Tribes.....	5-4
D. State Agencies	5-4
E. Local Officials.....	5-4
F. Libraries	5-4
G. Organizations and Firms.....	5-4
APPENDIX A - MAPS	A-1
APPENDIX B - BEAVER CREEK LANDSCAPE MANAGEMENT PROJECT PROPOSED TREATMENT DESCRIPTIONS	B-1
APPENDIX C - WATER QUALITY REGULATIONS AND BEST MANAGEMENT PRACTICES.....	C-1
APPENDIX D - TREATMENT PROPOSED BY ALTERNATIVE AND UNIT NUMBER	D-1
APPENDIX E - EFFECTS ON LARGE MATURE TREES	E-1
APPENDIX F - SOIL QUALITY MONITORING, PRE-AND-POST HARVEST ON THE CUSTER NATIONAL FOREST, SE MONTANA	F-1
Glossary.....	I
Index.....	XIII
References Cited	XVI

LIST OF FIGURES

FIGURE 1.1: PROJECT VICINITY MAP.....	1-1
FIGURE 1.2: 1905: PHOTO LOOKING NW TOWARDS BEAVER-CREEK – OTTER CREEK DIVIDE.....	1-3
FIGURE 1.3: 1994: LOOKING NW TOWARDS BEAVER-CREEK – OTTER CREEK DIVIDE.....	1-3
FIGURE 2.1: ALTERNATIVE A TREATMENT SUMMARY	2-6
FIGURE 2.2: ALTERNATIVE B TREATMENT SUMMARY.....	2-6
FIGURE 2.3: ALTERNATIVE C TREATMENT SUMMARY.....	2-6
FIGURE 3.1.1: CANOPY LAYER COMPARISON – ALTERNATIVES A, B, C AND D	3-21
FIGURE 3.1.2: PERCENT OF PONDEROSA PINE CANOPY COVER COMPARISON FOR ALTERNATIVES A, B, C AND D.....	3-22
FIGURE 3.1.3: BEETLE SUSCEPTIBILITY POST TREATMENT BY ACTION ALTERNATIVE.....	3-39
FIGURE 3.1.4: DEFORESTATION FROM THE 1988 BREWER FIRE AND 2002 KRAFT SPRINGS FIRE....	3-46
FIGURE 3.1.5: ACRES OF MOUNTAIN PINE BEETLE BY RISK LEVEL.....	3-48
FIGURE 3.2.1: FIRE REGIME CONDITION CLASS DESCRIPTION.....	3-61
FIGURE 3.2.2: TSMRS PI STRATA TYPES IN THE BCLMP AREA	3-64
FIGURE 3.2.3: BEAVER CREEK HISTORICAL VEGETATIVE STRUCTURAL CLASS DISTRIBUTION..	3-65
FIGURE 3.2.4: BEAVER CREEK CURRENT VEGETATIVE STRUCTURAL CLASS DISTRIBUTION ..	3-65
FIGURE 3.2.5: ALTERNATIVE A POST TREATMENT STRUCTURAL CLASS DISTRIBUTION	3-78
FIGURE 3.2.6: ALTERNATIVE B POST TREATMENT STRUCTURAL CLASS DISTRIBUTION	3-86
FIGURE 3.2.7: ALTERNATIVE C POST TREATMENT STRUCTURAL CLASS DISTRIBUTION.....	3-91
FIGURE 3.5.1: TREND IN VOLUME SOLD AND CUT ON THE CUSTER NATIONAL FOREST (1997- 2009).	3-166
FIGURE 3.5.2: TREND IN TIMBER REVENUE ON THE CUSTER NATIONAL FOREST (1997-2009).....	3-166
FIGURE 3.7.1: GRAZING ALLOTMENTS AND RANGE IMPROVEMENTS.....	3-195
FIGURE 3.7.2: PHOTO OF BEAVER CREEK ALLOTMENT RANGE READINESS SITE	3-199
FIGURE 3.7.3: WHITETAIL CABIN AREA, 7/21/1962 BLACK AND WHITE AERIAL PHOTOGRAPH, ASHLAND RANGER DISTRICT, CUSTER NATIONAL FOREST, MONTANA	3-207
FIGURE 3.7.4: WHITETAIL CABIN AREA, 8/30/2002 COLOR AERIAL PHOTOGRAPH, ASHLAND RANGER DISTRICT, CUSTER NATIONAL FOREST, MONTANA	3-208
FIGURE 3.8.1: WEED INFESTATION AND BCLMP AREA MAP.....	3-214
FIGURE 3.12.1: CARBON CYCLE DIAGRAM.	3-260
FIGURE 3.13.1: MONTANA AIRSHEDS.....	3-272
FIGURE 3.14.1: THE PHOTOGRAPH SHOWS AN ACTIVE (2009) BLACK-TAILED PRAIRIE DOG TOWN LOCATED IN FUNNEL DRAW AND THE EXISTING ROAD PROPOSED FOR A TIMBER HAUL ROUTE IN THE BEAVER CREEK PROJECT AREA, ASHLAND RD, CUSTER NF, MT.....	3-298
FIGURE 3.14.2: GOSHAWK TERRITORY = APPROXIMATELY 5,000 A	3-305
FIGURE 3.14.3: GOSHAWK NESTS ON THE ASHLAND DISTRICT.....	3-306
FIGURE 3.14.4: BIG GAME SECURITY AREAS 1	3-328
FIGURE 3.14.5: BIG GAME SECURITY AREAS 2	3-329
FIGURE 3.14.6: ELK HABITAT UTILIZATION IN RELATION TO MILES OF OPEN ROAD PER SQUARE MILE (LYON AND CHRISTENSEN, 2002, P. 568).	3-331

LIST OF TABLES

TABLE 1.1: VEGETATIVE DEPARTURE FROM HISTORIC REFERENCE LEVELS FOR THE BCLMP AREA	1-5
TABLE 2.1: SILVICULTURAL PRESCRIPTIONS.....	2-2
TABLE 2.2: TREATMENT SUMMARY BY ALTERNATIVE.....	2-5
TABLE 2.3: PROPOSED TREATMENT BY ALTERNATIVE.....	2-7
TABLE 2.4: SUMMARY OF COMMERCIAL TREATMENT (WITH OR WITHOUT PRESCRIBED FIRE)..	2-7
TABLE 2.5: SUMMARY OF NONCOMMERCIAL TREATMENT (HAND OR MASTICATION THINNING AND WITH OR WITHOUT PRESCRIBED FIRE).....	2-8
TABLE 2.6: APPROXIMATE COMMERCIAL VOLUME BY ALTERNATIVE	2-8
TABLE 2.7: OPENINGS THAT WOULD BE CREATED OVER 40 ACRES IN SIZE	2-9
TABLE 2.8: PRESCRIBED FIRE PARAMETERS BY TREATMENT TYPE	2-11
TABLE 2.9: MINIMUM TREES PER ACRE (TPA) AND PERCENT STOCKED AREA BY SUITABILITY FOR CERTIFICATION OF REGENERATION.....	2-12
TABLE 2.10: DESCRIPTION OF PFISTER ET AL 1977 HABITAT TYPES	2-13
TABLE 2.11: SUMMARY OF ROADS AND TRAILS ACTIVITY TO IMPLEMENT ACTION ALTERNATIVES	2-13
TABLE 2.12: ROAD OBLITERATION	2-15
TABLE 2.13: ROADS AND TRAILS: ROUTE CLASSIFICATION AND PROPOSED ACTIVITY BY ALTERNATIVE.....	2-17
TABLE 2.14: DESIGN FEATURES AND MITIGATION INCLUDED IN THE PROPOSED ACTION.	2-20
TABLE 2.15: ALTERNATIVE A - PROPOSED TREATMENT BY MANAGEMENT AREA.....	2-29
TABLE 2.16: ALTERNATIVE B – PROPOSED TREATMENT BY MANAGEMENT AREA.....	2-29
TABLE 2.17: ALTERNATIVE C – PROPOSED TREATMENT BY MANAGEMENT AREA	2-30
TABLE 2.18: PROJECTS CONSIDERED IN CUMULATIVE EFFECTS ASSESSMENT FOR THE BEAVER CREEK LANDSCAPE MANAGEMENT PROJECT	2-39
TABLE 2.19: SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE.....	2-47
TABLE 3.1.1: TREATMENT UNITS GREATER THAN 40 ACRES BY ALTERNATIVE	3-5
TABLE 3.1.2: PAST MANAGEMENT ACTIVITIES AND WILDFIRE IN BCLMP AREA.....	3-7
TABLE 3.1.3: KEY CHANGES IN DRY FOREST LANDSCAPES	3-9
TABLE 3.1.4: GENERALIZED ASSESSMENT FOR RISK OF BARK BEETLE SUSCEPTIBILITY FOR PONDEROSA PINE	3-15
TABLE 3.1.5: ALTERNATIVE COMPARISON OF CANOPY LAYER TYPE (ACRES AND PERCENT) AND PERCENT OF CHANGE FROM NO ACTION (ALT D) - PONDEROSA PINE FORESTED AREA....	3-20
TABLE 3.1.6A: ALTERNATIVE COMPARISON OF CANOPY COVER CLASSES (ACRES AND PERCENT) AND PERCENT CHANGE FROM THE NO ACTION (ALT D) - BCLMP AREA.....	3-20
TABLE 3.1.6B: - ALTERNATIVE COMPARISON OF CANOPY COVER CLASSES (ACRES AND PERCENT) AND PERCENT CHANGE FROM THE NO ACTION (ALT D) - PONDEROSA PINE FORESTED AREA	3-21
TABLE 3.1.7: OTHER REQUIRED DISCLOSURES FOR THE PROPOSED ACTION ALTERNATIVE	3-36
TABLE 3.1.8: ESTIMATED BEETLE INFESTATION BY AVERAGE TREES PER ACRES AND ACRES FOR MOUNTAIN PINE BEETLE AND PINE ENGRAVER DURING THE 2007, 2008, AND 2009 AERIAL DETECTION SURVEYS	3-47
TABLE 3.1.9: MOUNTAIN PINE BEETLE SUSCEPTIBILITY IN THE BCLMP AREA	3-47
TABLE 3.1.10: OTHER REQUIRED DISCLOSURES UNDER ALTERNATIVE D FOR EFFECTS TO FOREST VEGETATION	3-49
TABLE 3.1.11: FOREST PLAN CONSISTENCY OF ALTERNATIVE D FOR EFFECTS TO FOREST VEGETATION	3-51
TABLE 3.2.1: VEGETATIVE DEPARTURE FROM HISTORIC REFERENCE LEVELS FOR THE BCLMP AREA.....	3-64
TABLE 3.2.2: NEXUS TORCHING AND CROWN FIRE INDICES.....	3-68
TABLE 3.2.3: BCLMP FUELS ANALYSIS TREATMENT CATEGORIES.....	3-71
TABLE 3.2.4: ACRES TREATED COMPARISON BETWEEN ALTERNATIVES	3-72

TABLE 3.2.5: ALTERNATIVE A: NEXUS POST TREATMENT RESULTS AND ACRES BY TREATMENT CATEGORY.....	3-76
TABLE 3.2.6: BCLMP- ALTERNATIVE A POST-TREATMENT FRCC DISTRIBUTION.....	3-77
TABLE 3.2.7: NEXUS TORCHING AND CROWN FIRE INDICES.....	3-80
TABLE 3.2.8: ALTERNATIVE B: NEXUS POST TREATMENT RESULTS AND ACRES BY TREATMENT CATEGORY.....	3-85
TABLE 3.2.9: BCLMP- ALTERNATIVE B POST-TREATMENT FRCC DISTRIBUTION.....	3-86
TABLE 3.2.10: ALTERNATIVE C: NEXUS POST TREATMENT RESULTS AND ACRES BY TREATMENT CATEGORY.....	3-90
TABLE 3.2.11: BCLMP- ALTERNATIVE C POST-TREATMENT FRCC DISTRIBUTION.....	3-91
TABLE 3.2.12: TORCHING INDEX AND CROWNING INDEX FOR VARIOUS CANOPY CLOSURE LEVELS.....	3-94
TABLE 3.3.1: SOIL MAP UNITS IN THE BCLMP AREA ¹	3-102
TABLE 3.3.2: SOIL DISTURBANCE CLASSES	3-105
TABLE 3.3.3: KEY MEASUREMENTS FOR INTENSIVELY SAMPLED SITES IN THE BCLMP AREA..	3-107
TABLE 3.3.4: ALTERNATIVE A: TEMPORARY ROADS.....	3-117
TABLE 3.3.5: ALTERNATIVE B: TEMPORARY ROADS.....	3-118
TABLE 3.3.6: ALTERNATIVE C - TEMPORARY ROADS.....	3-120
TABLE 3.4.1: EXISTING ACTIVITIES (PAST AND PRESENT) BY 6 HUC WATERSHED.....	3-138
TABLE 3.4.2: EXISTING ECA (PAST AND PRESENT) BY 6 HUC WATERSHED.....	3-139
TABLE 3.4.3: PROPOSED TREATMENT ACRES AND ESTIMATED ECA ACRES BY ALTERNATIVE.	3-141
TABLE 3.4.4: CUMULATIVE ECA ACRES – PAST, PRESENT AND PROPOSED ACTIVITIES.....	3-145
TABLE 3.5.1: ECONOMIC MEASURES OF SUCCESS AND ANALYSIS METHODS.....	3-162
TABLE 3.5.2: THE TREND IN VOLUME CUT AND SOLD FOR THE CUSTER NATIONAL FOREST AND REVENUE RECEIVED.....	3-165
TABLE 3.5.3: PROJECT FEASIBILITY AND FINANCIAL EFFICIENCY SUMMARY (2009 DOLLARS).....	3-168
TABLE 3.5.4: PROJECT ACTIVITY EXPENDITURES BY ALTERNATIVE OVER A SEVEN-YEAR PERIOD (\$2009).....	3-171
TABLE 3.5.5: RESOURCE ACTIVITIES NOT TIED TO COMMERCIAL HARVEST (\$2009).	3-172
TABLE 3.5.6: ALTERNATIVE A TIMBER HARVEST AND PROCESSING EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-173
TABLE 3.5.7: ADDITIONAL ALTERNATIVE A LAND MANAGEMENT ACTIVITIES- EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-173
TABLE 3.5.8: ALTERNATIVE B TIMBER HARVEST AND PROCESSING EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-174
TABLE 3.5.9: ADDITIONAL ALTERNATIVE B LAND MANAGEMENT ACTIVITIES- EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-174
TABLE 3.5.10: ALTERNATIVE C TIMBER HARVEST AND PROCESSING EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-175
TABLE 3.5.11: ADDITIONAL ALTERNATIVE C LAND MANAGEMENT ACTIVITIES- EMPLOYMENT AND LABOR INCOME (2009 DOLLARS) OVER THE LIFE OF THE PROJECT.....	3-175
TABLE 3.6.1: ASHLAND DISTRICT SENSITIVE PLANTS	3-179
TABLE 3.6.2: EFFECTS DETERMINATION BY ALTERNATIVE	3-193
TABLE 3.8.1: USFS REGION 1 NOXIOUS WEED RISK RATINGS.....	3-212
TABLE 3.9.1: CUSTER FOREST PLAN DIRECTION FOR SCENIC RESOURCES.....	3-222
TABLE 3.11.1: SITES ASSOCIATED WITH PROPOSED TREATMENTS BY ALTERNATIVE	3-254
TABLE 3.11.2: SITES ASSOCIATED WITH PROPOSED ROAD ACTIVITY BY ALTERNATIVE	3-254
TABLE 3.13.1: SOURCES OF SMOKE EMISSIONS	3-277
TABLE 3.13.2: ALTERNATIVE A - SMOKE IMPACT PM _{2.5} ESTIMATES.....	3-278
TABLE 3.13.3: ALTERNATIVE B - SMOKE IMPACT PM _{2.5} ESTIMATES.....	3-278
TABLE 3.13.4: ALTERNATIVE C - SMOKE IMPACT PM _{2.5} ESTIMATES	3-279
TABLE 3.14.1: WILDLIFE SPECIES ANALYZED IN DETAIL. ^{1,4}	3-285
TABLE 3.14.2: WILDLIFE SPECIES NOT ANALYZED IN DETAIL. ¹	3-290

TABLE 3.14.3: SUMMARY OF CONFIRMED AND POTENTIAL GOSHAWK NEST TERRITORIES, ASHLAND RD, CUSTER NF, 2010.....	3-307
TABLE 3.14.4: EXISTING POTENTIAL FORAGING AND NESTING HABITAT AVAILABLE FOR GOSHAWKS WITHIN THE SIX MAPPED GOSHAWK PFA'S AND OUTSIDE THE PFA'S ON THE ASHLAND RD.....	3-310
TABLE 3.14.5: EXISTING NEST STAND HABITAT AVAILABLE FOR GOSHAWKS WITHIN THE PROJECT AND CUMULATIVE EFFECTS ANALYSIS AREA (FOUR MAPPED GOSHAWK PFAS OUTSIDE OF THE BCLMP AREA AND OUTSIDE THE PFAS) ON THE ASHLAND RD.....	3-312
TABLE 3.14.6: POST-FLEDGLING FAMILY AREA HABITAT ANALYSIS FOR HOLIDAY SPRINGS CG GOSHAWK NEST TERRITORY.....	3-315
TABLE 3.14.7: POST-FLEDGLING FAMILY AREA HABITAT ANALYSIS FOR GREEN CREEK GOSHAWK NEST TERRITORY.....	3-316
TABLE 3.14.8: POST-FLEDGLING FAMILY AREA HABITAT AVAILABLE FOR GOSHAWKS WITHIN THE CUMULATIVE EFFECTS ANALYSIS AREA (FOUR MAPPED GOSHAWK PFAS OUTSIDE OF THE BCLMP AREA AND OUTSIDE THE PFAS) ON THE ASHLAND RD.....	3-318
TABLE 3.14.9: FORESTED COVER FOR BIG GAME IN THE CUMULATIVE EFFECTS ANALYSIS AREA.....	3-326
TABLE 3.14.10: BIG GAME SECURITY AREA AND SECURITY COVER FOR THE CUMULATIVE ANALYSIS AREA AND BCLMP AREA BY ALTERNATIVE. ¹	3-330
TABLE 3.14.11: ROAD DENSITY FOR THE ASHLAND RD, CUMULATIVE EFFECTS ANALYSIS AREA, AND BCLMP AREA. ¹	3-332
TABLE 3.14.12: SNAGS PER ACRE ON THE ASHLAND RD BASED ON FIA SAMPLES, 1997 (LUNDBERG, 2008.01.25).....	3-340
TABLE 3.14.13: SUMMARY OF SNAG CONDITION CLASSES, DIAMETER CLASS, AND DENSITIES (SNAGS/ACRE) DETECTED IN PLOTS, BCLMP AREA, DEC. 10–15, 2009 ¹	3-341
TABLE 3.14.14: FOREST PLAN, LAW, REGULATION, AND POLICY CONSISTENCY FOR WILDLIFE AND HABITAT MANAGEMENT ISSUES FOR THE NO ACTION AND PROPOSED TREATMENT ALTERNATIVES.....	3-358
TABLE 5.1: ID TEAM MEMBERS AND PROJECT CONTRIBUTORS.....	5-1
TABLE C.1: SOIL AND WATER CONSERVATION PRACTICES	C-9
TABLE E-1: PERCENT AND ACRES OF PONDEROSA PINE IN BCLMP PROMOTING LARGE MATURE TREES BY TREATMENT BY ALTERNATIVE.....	E-2